For administration of a MERET vaccine to a subject, the vaccine can be combined with an adjuvant. A representative adjuvant is PROVAXO, which is described in U. S. Patent Nos.

5,585, 103; 6,270, 769; and 6,197, 311, each incorporated herein in its entirety. Polyvalent vaccines can be prepared by combining MERET with other cancer antigens, inlcuding, for example, but not limited to Mesothelin, mutant K-ras, CEA, and Her 2/nu.

For treatment of cancer, a monovalent or polyvalent MERET vaccine can be combined with additional anti-cancer therapies, such as immunomodulatory antibodies (e. g. , anti-TGFb, anti-IL10, anti-CTLA-4) or chemotherapies, including low dose chemotherapies such as cyclophosphamide and melphalan. MERET vaccines can be used to treat cancers in tissues where MERET is overexpressed, such as ovarian cancer (Figure 15). MERET is also expressed at low levels in normal tissues such as spleen and testis (Figure 16), and may be similarly misregulated in the cancers of these tissues.

Description Claims

WHAT IS CLAIMED IS: 1. An isolated nucleic acid encoding a cancer cell antigen selected from the group consisting of : (a) the nucleotide sequence of any one of SEQ ID NOs : 1, 2,6, 9,11, 14,16, 20,21, 23,28, 37,38, 39,40, 41,42, 43, and 44 ; (b) a nucleotide sequence encoding SEQ ID NO : 22 or 32; and (c) a nucleotide sequence complementary to (a) or (b).

2. The isolated nucleic acid of claim 1, wherein the cancer cell antigen comprises one or more MHC class I binding epitopes.

3. The isolated nucleic acid of claim 1, wherein the cancer cell antigen has a capability to elicit cytotoxic T cell lysis.

4. An isolated nucleic acid comprising a nucleic acid sequence that is at least 70% identical to the sequence of the nucleic acid of claim 1, and which encodes a cancer cell antigen comprising one or more MHC class I binding epitopes.

5. The isolated nucleic acid of claim 4, wherein the nucleic acid sequence is at least 90% identical to the sequence of the nucleic acid of claim 1.

6. The isolated nucleic acid of claim 4, wherein the cancer cell antigen has a capability to elicit cytotoxic T cell lysis.

7. An isolated nucleic acid encoding a cancer antigen comprising one or more MHC class I binding epitopes, which nucleic acid hybridizes to the complement of the nucleic acid of claim 1 under the following stringent conditions: a final wash in 0. 1X SSC at 65°.

8. The isolated nucleic acid of claim 7, wherein the cancer cell antigen has a capability to elicit cytotoxic T cell lysis.

9. A diagnostic reagent for detection of cancer comprising a nucleic acid according to claim 1 and a detectable label.

10. A diagnostic reagent comprising primers that result in the specific amplification of the nucleic acid of claim 1.

11. A method for detecting cancer comprising obtaining a human cell sample and detecting a nucleic acid of claim 1 in the cell sample.

12. The method of claim 11, wherein the method comprises detecting specific hybridization to a nucleic acid of claim 1.

13. The method of claim 11, wherein the method comprises amplifying a nucleic acid of claim 1.

14. The method of claim 11, wherein the method comprises detecting a cancer antigen encoded by a nucleic acid of claim 1.

15. The method of claim 14, wherein the detecting comprises binding of an antibody to the cancer antigen.

16. The method of claim 15, further comprising an ELISA or competitive binding assay.

17. A therapeutic reagent comprising a nucleic acid that hybridizes with a nucleic acid of claim 1 and an effector moiety.

18. The therapeutic reagent of claim 17, wherein the effector moiety is a radionuclide, an enzyme, a cytotoxin, a growth factor, or a drug.

19. A method for treating cancer, which comprises administering to a subject in need thereof a therapeutically effective amount of a ribozyme or antisense oligonucleotide that inhibits the expression of a nucleic acid of claim 1.

20. A method for treating cancer, which comprises administering to a subject in need thereof a therapeutic reagent of claim 17.

21. A cancer cell antigen selected from the group consisting of : (a) an antigen encoded by a nucleic acid sequence of claim 1 ; and (b) fragments or variants of (a) that bind to antibodies that specifically bind the antigen of (a).

22. The antigen of claim 21, wherein the antigen comprises one or more MHC class I binding epitopes.

23. The antigen of claim 22, wherein the one or more MHC class I binding epitopes are selected from the group consisting of an HLA-A0201 binding epitope, an HLA-24 binding epitope, an HLA-A3 binding epitope, an HLA-A1 binding epitope, an HLA-B7 binding epitope, and combinations thereof.

24. The antigen of claim 21, wherein the antigen comprises an amino acid sequence of SEQ ID NO : 22, or MHC class I binding fragment thereof.

25. The antigen of claim 21, wherein the antigen comprises an amino acid sequence of SEQ ID NO : 32, or MHC class I binding fragment thereof.

26. A vaccine comprising an antigen of claim 21 and an adjuvant.

27. The vaccine of claim 26, wherein the antigen comprises one or more MHC class I binding epitopes.

28. The vaccine of claim 27, wherein the one or more MHC-binding epitopes are selected from the group consisting of an HLA-A0201 binding epitope, an HLA-24 binding epitope, an HLA-A3 binding epitope, an HLA-A1 binding epitope, an HLA-B7 binding epitope, and combinations thereof.

29. The vaccine of claim 28, wherein the antigen comprises SEQ ID NO : 22, or MHC class I binding fragment thereof.

30. The vaccine of claim 26, further comprising a capability to elicit a humoral or cytotoxic T lymphocyte response to the antigen.

31. A method for treating cancer, which comprises administering to a subject in need thereof a vaccine comprising a therapeutically effective amount of a vaccine of claim 26.

32. The method of claim 29, wherein the vaccine is administered in combination with a chemotherapeutic agent.

33. A monoclonal antibody or antigen binding fragment thereof, which specifically binds to the antigen of claim 21.

34. The monoclonal antibody of claim 33 which is a chimeric, human, or humanized antibody.

35. A diagnostic reagent comprising an antibody or antigen binding fragment of claim 33 and a detectable label.

36. A therapeutic reagent comprising an antibody or antigen binding fragment of claim 33 and an effector moiety bound.

37. The therapeutic reagent of claim 36, wherein the effector moiety is a radionuclide, an enzyme, a cytotoxin, a growth factor, or a drug.

38. A method for treating cancer, which comprises administering to a subject in need thereof a therapeutically effective amount of an antibody or antigen binding fragment of claim 33.

39. The method of claim 38, wherein the antibody is administered in combination with a chemotherapeutic agent.

40. A method for treating cancer, which comprises administering to a subject in need thereof a therapeutically effective amount of a reagent of claim 36.

41. The method of claim 40, wherein the therapeutic reagent is administered in combination with a chemotherapeutic agent.

42. A monoclonal antibody or antigen binding fragment thereof that specifically binds Anat-2 antigen.

43. The monoclonal antibody of claim 42 which is a chimeric, human, or humanized antibody.

44. A diagnostic reagent comprising an antibody or antigen binding fragment of claim 42 and a detectable label.

45. A therapeutic reagent comprising the monoclonal antibody or antigen binding fragment of claim 42 and an effector moiety.

46. The therapeutic reagent of claim 45, wherein the effector moiety is a radionuclide, an enzyme, a cytotoxin, a growth factor, or a drug.

47. The therapeutic reagent of claim 46, wherein the radionuclide is 90Y or 131I.

48. The monoclonal antibody or antigen binding fragment of claim 42, which does not specifically bind to Anat-1, Anat-3 or Anat-4.

49. A method of treating cancer comprising administering to a subject in need thereof a therapeutically effective amount of the antibody or antigen binding fragment of claim 42.

50. The method of claim 49, wherein the antibody is administered in combination with a chemotherapeutic agent.

51. A method of treating cancer comprising administering to a subject in need thereof a therapeutically effective amount of the therapeutic reagent of claim 45.

52. The method of claim 51, wherein the antibody is administered in combination with a chemotherapeutic agent.